

# THE NEXT BIG STEPS FOR MUNITIONS RESPONSE

## Technical Session 2B Classification Applied to Munitions Response – Development

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**THE NEXT BIG STEPS FOR MUNITIONS RESPONSE**

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Continued successes in advanced classification are moving our industry closer to their broad transition and mainstream use. Some barriers to transitioning advanced classification that just three years ago were thought to be huge brick walls are now just rubble under the ROC curve. Those that remain are already starting to come down as we learn to apply our models and classification algorithms. Demonstration successes from 2010 and 2011 and work currently ongoing through the ESTCP will be discussed in the context of the next steps needed to get these tools widely accepted in the DoD's Military Munitions Response Program.



# Briefing Agenda

- The One Big Thing
- What's going on now
  - ▶ Shift the paradigm
- The next hurdles
  - ▶ How do we communicate this is the right thing to do?
  - ▶ Project-level process workflows
- What I Need From You
- My Crystal Ball

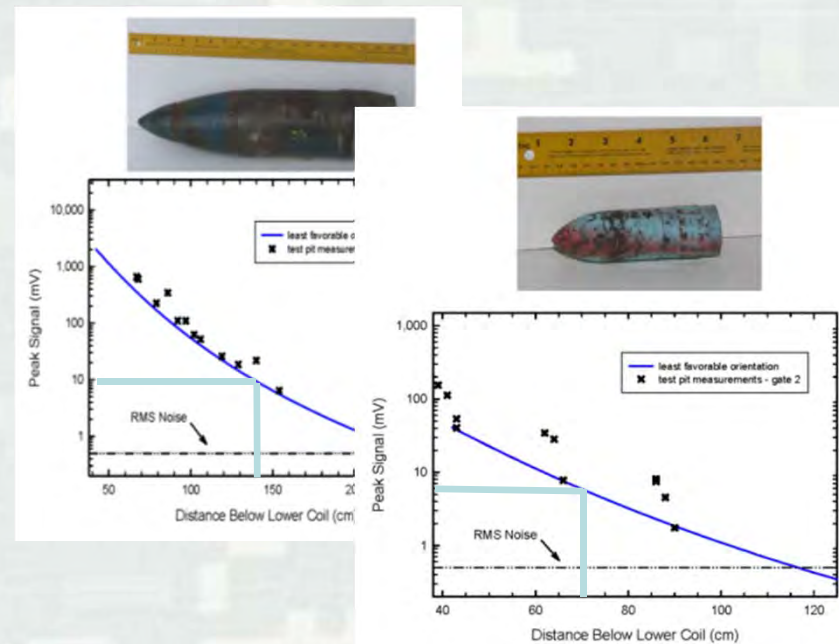


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# The One Big Thing

- Not leaving the easy stuff:
  - ▶ a 105mm @ a meter
  - ▶ Or a 37mm @ 0.3m



What this means to me:

- How do we know we have good data?
- What do good decisions “look” like?





# Why is Everything Upside Down?

- **mag&flag**

- Easy to understand (one switch & only 5 settings)
- Belief that “everything” gets picked up
- Been doing this since the 1940’s

- **Current DGM**

- Those geophysicists are weird and speak a different language (?Geophysees?)
- But their tools seem work pretty well
- Been doing this since mid-1990’s

- **Advanced Classification**

- Its new & I don’t understand it
- What the heck are Eigenvalues...& I don’t understand it
- What the heck is a feature vector...& I don’t understand it
- These geophysicists are more weird than those others & I think they’re using English words but I’m not sure



# Why is Everything Upside Down?

Implicit Level  
of “Comfort”

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# Need to Change The Paradigm

What's really going on

- **mag&flag**

- Least sensitive instrumentation
- Most prone to poor system performance
- Cannot quantify what a “dig decision” means

- **Current DGM**

- Very sensitive instrumentation
- System performance can be monitored throughout
- Dig decisions boil down to “Big” vs. “Small”

- **Advanced Classification**

- Most sensitive instrumentation
- System performance is quantified
- Dig decisions built from the underlying physics

Knowledge of what  
we're leaving behind





# How Do We Communicate This Is The Right Thing To Do?

What's really going on

The New Paradigm

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- **Current DGM**

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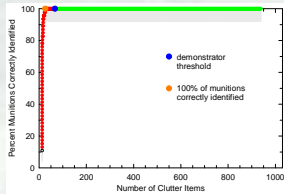
- Most sensitive instrumentation
- System performance is quantified
- Dig decisions built from the underlying physics



# How Do We Communicate This Is The Right Thing To Do?



“That’s the way we’ve always done it”  
= noise to us



“Look at that pretty ROC curve”  
= noise to them

Boils down to choice

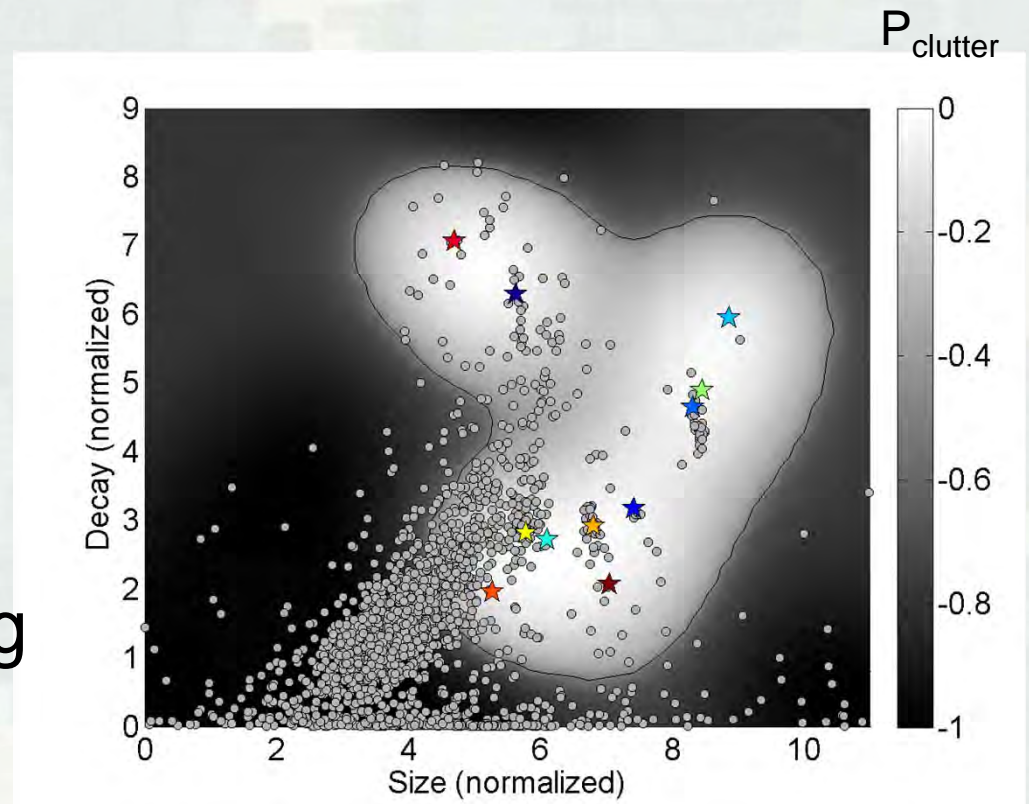
- The right people
- The right tools
- A plan that makes sense





# What does “A plan that makes sense” mean?

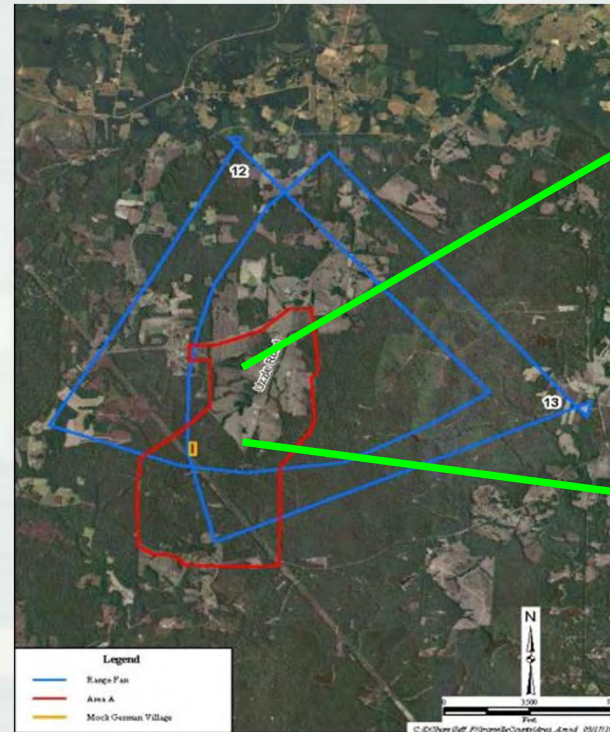
- The ROC curve needs to have meaning
  - ▶ Why did you stop digging
  - ▶ Why did you select the things you did dig
  - ▶ “Comfort” needs to come out of the equation





# What does “A plan that makes sense” mean?

Camp Butner:  
Artillery Impact  
Area (Area A)



37-mm projectiles  
105-mm projectiles  
155-mm projectiles

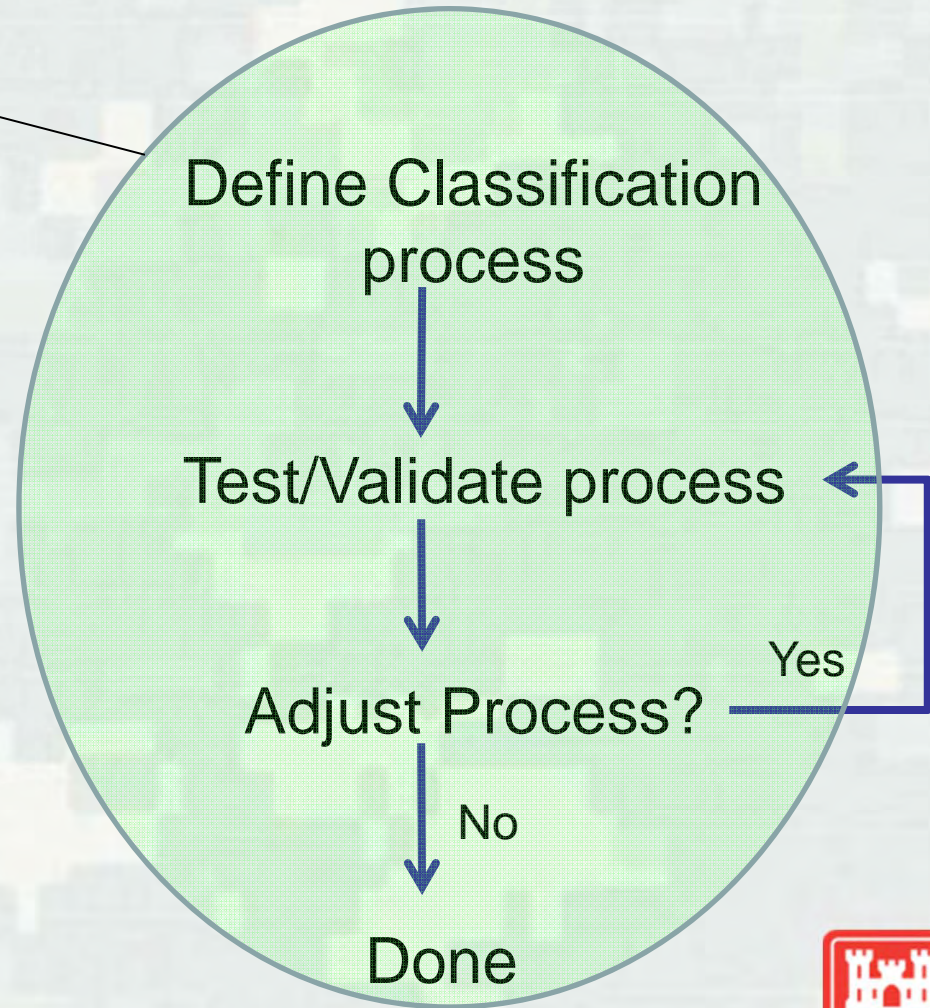
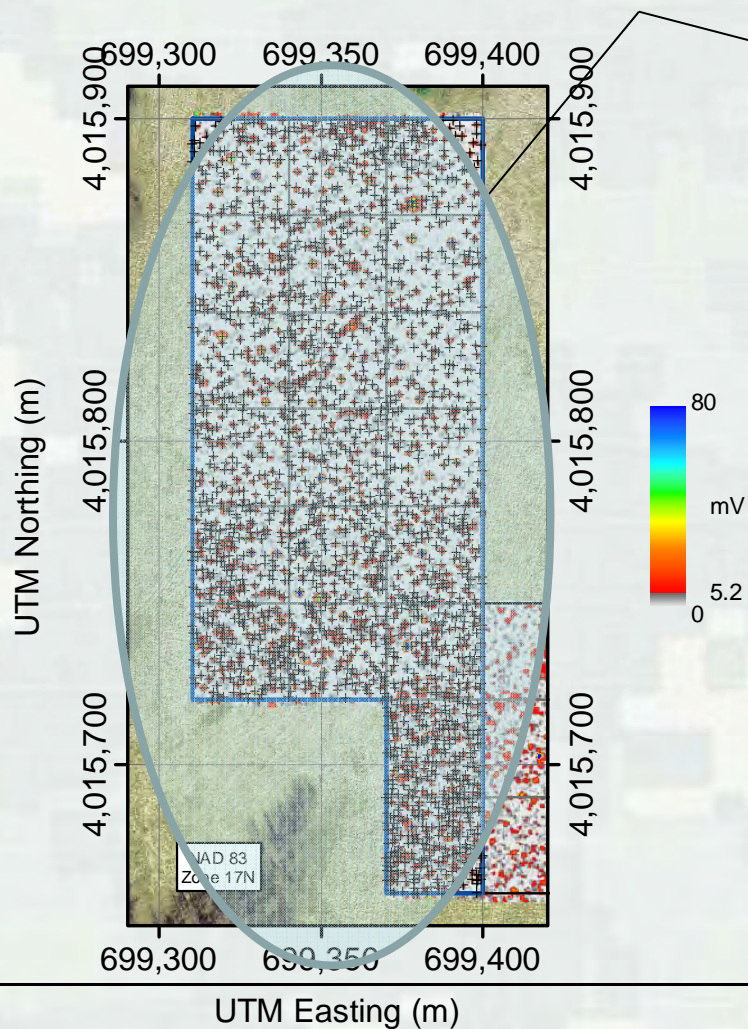
The *Classification Process* needs to make sense for the whole project site  
(aka Munitions Response Site)





# Process Workflow

This is an ESTCP demonstration

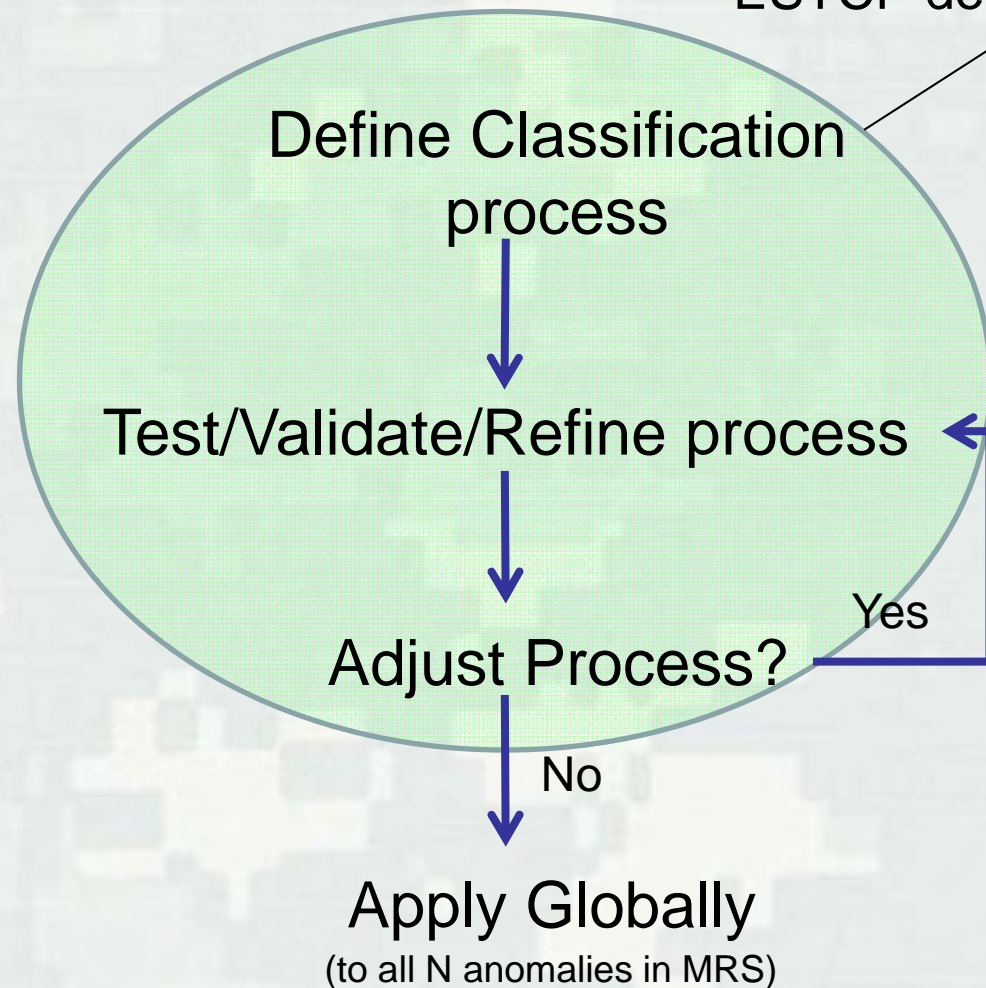


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# Need A Process Workflow For The Whole MRS

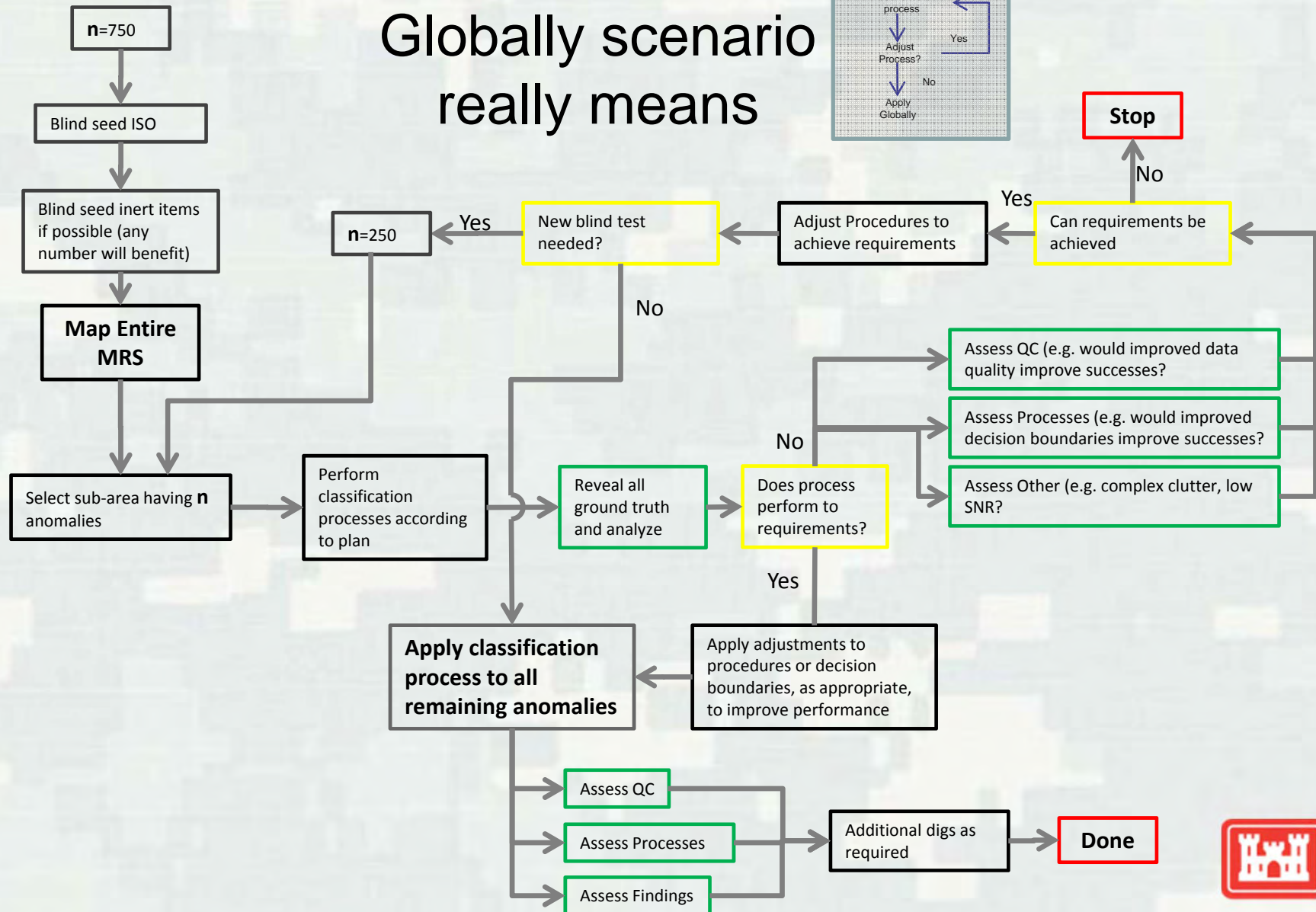
This could look like an ESTCP demonstration



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# What an Apply Globally scenario really means



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# What I Need From You

- How do I explain we didn't miss the easy stuff?
- What are the important “back-up” materials I need to show we made the right decisions?
- Classification Processes designed for the whole MRS
- Challenge people who think they “get it all” using lesser technologies
- Up for discussion:
  - ▶ What are reasonable and achievable goals for
    - % UXO recovered
    - Clutter not needing to be excavated





# My Magic 8 Ball



Near term:

- Will we be able to do this by 2025? Or will it be 2030? Or will it be 2035? Or will it be 2040? Or will it be 2045? Or will it be 2050? Or will it be 2055? Or will it be 2060? Or will it be 2065? Or will it be 2070? Or will it be 2075? Or will it be 2080? Or will it be 2085? Or will it be 2090? Or will it be 2095? Or will it be 2100?





# My Magic 8 Ball



Long term:

- Will we implement a crossing zone and evacuations based on munitions ID?



# Thank You

## Army UXO Safety Program



Learn and Follow  
the **3Rs**

**RECOGNIZE:** The danger that a souvenir  
munition poses to yourself,  
your family and your neighbors

**RETREAT:** Do not disturb, touch or move it  
Do not give or throw it away

**REPORT:** Call 911

